

IN THE SPECIFICATION:

Please amend paragraph number [0002] as follows:

[0002] State of the Art: In order to manufacture carrier substrates (e.g., circuit boards, interposers, etc.) and semiconductor dice in quantity, a large-scale substrate comprising a large number of unsingulated units is typically processed en masse, then the units separated from one another, typically by sawing the large-scale substrate. In the case of carrier substrates, the large-scale large-scale substrate may be either a single-layered or laminated organic substrate, such as FR-4 board, upon which a number of carrier substrates are formed. Semiconductor dice may be fabricated on a wafer or other large-scale semiconductor substrate. The dice may then be scribed or sawn into individual dice. Singulated carrier substrates and semiconductor dice are often used in finishing operations, including packaging. As the state-of-the-art densities of carrier substrates and semiconductor dice on their respective large-scale substrates are ever increasing, the need for accurate rigid placement of dicing saw blades is apparent.

Please amend paragraph number [0035] as follows:

[0035] FIGs. 6C and 6D are top and side views, respectively, of an embodiment of a retention ring incorporating teachings of the present invention; and

Please amend paragraph number [0036] as follows:

[0036] FIG. 7 is a partial side cross-sectional view of a third embodiment of a blade retention assembly incorporating the teachings of the present invention; and

Please insert paragraph number [0036.1] as follows:

[0036.1] FIG. 8 is a schematic cross-sectional representation of an exemplary blade retention assembly.

Please amend paragraph number [0041] as follows:

[0041] Significantly, dicing saw blade 50 is positioned between two rigid bodies.

Additionally, shaped flange 30 and retention element 22 each may be tapered toward the radial tip of dicing saw blade 50, thus imparting rigid support to the radial blade tip. Also, tapering provides clearance around the edges of the dicing saw blades, so that the radial tips of the flange and spacer do not collide with any components or features that extend from the surface of the wafer or other substrate during dicing. Additional dicing saw blades may be assembled as shown by way of additional shaped flanges 32, 34, and 36 as well as corresponding retention-spacers elements 24, 26, and 28. Furthermore, each retention-spacer element 24, 26, and 28 engages a biasing element 42, 44, and 46, respectively. Ideally, shaped flanges 32, 34, and 36 are machined to identical axial thicknesses to facilitate accurate positioning of dicing saw blades 50, 52, and 54. An end spacer 38 may be employed to distribute compressive force to the assembly of dicing saw blades and retention means, as well as engage biasing element 46.

Please amend paragraph number [0042] as follows:

[0042] Biasing elements 40, 42, 44, and 46 may be substantially circumferentially or peripherally constrained. As shown in FIG. 3B, ~~an aperture~~ ~~a recess~~ 23 is formed in a substantially planar retention surface 27 of each retention element 22, 24, 26, and 28, exemplified in FIG. 3B by retention element 22. Recess 23 is sized to at least partially receive a portion of at least one biasing element (not shown) with another portion of the at least one biasing element protruding axially from the radial surface 27 of each retention-spacer element 22, 24, 26, and 28. Circumferential or peripheral constraint applied to a biasing element of the present invention is advantageous to provide control of the axial biasing face provided thereby.

Please amend paragraph number [0045] as follows:

[0045] Significantly, and referring again to FIG. 3A, the present invention accommodates dicing saw blades of differing thickness in an assembly while retaining accurate

axial positioning of each blade. Dicing saw blade 50 causes retention element 22 to displace toward shaped flange 32. Accordingly, biasing element 40 is compressed between radial surface 39 of the recess and axial surface 31 of the shaped flange 32. Axial distance 29 between radial surface 27 of a retention spacer and axial surface 31 or 31' depends on the thickness of the dicing saw blade. However, shaped flanges 30, 32, 34, and 36 as well as corresponding retention ~~spacers~~ elements 22, 24, 26, and 28 are designed so that radial surface 27 of any retention spacer does not contact any axial surface 31 or 31'. Thus, the dicing saw blade thickness does not influence the axial position of adjacent shaped flanges and therefore does not influence the position of any other blades assembled within the dicing saw blade retention assembly 19 of the present invention.

Please amend paragraph number [0047] as follows:

[0047] Specifically, the surface 51 of dicing saw blade 50 is a fixed axial distance from the congruent surface 53 of dicing saw blade 52, determined by the axial position of the dicing saw blade 50 within shaped flange 30, the axial dimension of auxiliary pitch spacer 60, and the axial position of dicing saw blade 52 within shaped flange 32. Upon installing a dicing saw blade 50 within shaped flange 30 the blade thickness (i.e., the distance between surface 51 and 51') causes the associated retention element 22 to be displaced toward the adjacent auxiliary pitch spacer 60. Thus, the retention ~~spacers~~ elements 22 and 24 accommodate dicing saw blades 50 and 52 of different thicknesses without changing the axial distance between surface 51 and congruent surface 53 as well as the distance between surface 53 and surface 55. The use of auxiliary spacers according to the present invention may be advantageous to achieve desired dicing saw blade spacing without changing the shaped flange or retention spacer configuration as would be required to change the dicing saw blade spacing in the embodiment shown in FIG. 3A.

Please amend paragraph number [0048] as follows:

[0048] As mentioned hereinbefore, and with reference to FIG. 4B, a retention feature 45 may be included in order to fix the radial position of the at least one biasing element

with respect to the axis 10 of rotation. The retention feature 45 may comprise at least one indentation. Alternatively, or additionally, the retention feature 45 may comprise at least one protrusion. FIG. 4B shows several embodiments of retention features 45 in a dicing saw blade retention assembly 19. As a first example, retention element 22 is formed with an arcuate indentation as a retention feature 45 for biasing element 40. In addition, auxiliary pitch spacer 60 is also configured with an arcuate indentation as a retention feature 45 for constraining biasing element 40. A second example includes a retention feature configured into auxiliary pitch spacer 62 only, and is a generally planar radial surface with axial walls, thus forming a recess to constrain biasing element 42. Biasing element 42 is shown as a thin compressible button, illustrating another possible embodiment. A third example for retention feature 45 illustrated in FIG. 4B is a protrusion extending axially from radial surface 27 of retention-spacer element 26. Retention feature 45 of retention-spacer element 26 provides, among other things, a radial ledge to fix the position of the biasing element 44. Thus, retention feature 45 may comprise at least one indentation and/or protrusion for receiving at least one biasing element.

Please amend paragraph number [0051] as follows:

[0051] FIG. 7 illustrates yet another embodiment of a dicing saw blade retention assembly 19 of the present invention wherein a biasing element (not shown) axially biases more than one retention spacer, thus biasing more than one dicing saw blade. Shaped flange 30 and shaped flange 32 are of substantially identical geometry, but installed such that the shaped flange 30 is axially opposed to shaped flange 32, axially opposed meaning that congruent axial surfaces of each flange are facing each other. Similarly, retention-element elements 22 and 24 are also substantially identical in geometry, and are installed on hub 20 in an opposing axial relationship. Thus, recesses 23 are radially aligned and are also longitudinally opposing, allowing for a single biasing element (not shown) to be installed between retention element 22 and retention-spacer element 24. Further dicing saw blade installation may be accomplished as shown by dicing saw blades 54 and 55, and 56.

Please amend paragraph number [0052] as follows:

[0052] Dicing saw blade spacing as determined by the fixtures depicted in FIG. 7 is different than the embodiments depicted in FIG. 3A and FIG. 4A. In FIG. 7, pairs of shaped flanges facing in opposite directions position dicing saw blades that may be axially centered on each flange. Furthermore, pairs of retention spacers are configured with an associated pair of flanges and are also facing in opposite directions, separated by a biasing element. The first pair of shaped flanges 30 and 32 are facing in opposite directions with dicing saw blades 50 and 52 matingly engaging each axial surface 33 of each flange. Retention-spacers-elements 22 and 24 are respectively configured with flanges 30 and 32, respectively, and are also facing each other, in opposing fashion, so that radial surface 27 of retention element 22 is directly axially adjacent to the radial surface 27 of retention-spacer-element 24. A biasing element (not shown) separates radial surface 27 of retention element 22 from retention-radial surface 27 of retention-spacer-element 24 and is positioned between radial surface 37-39 of the recess 23 in retention element 22 and radial surface 37-39 of the recess 23 in retention-spacer-element 24. Axial distance 29 depends on the thickness of dicing saw blades 50 and 52 as well as the axial dimension of retention-spacers-elements 22 and 24. Axial distance 29 provides axial allowance for accommodating blades of differing thickness without affecting the axial distance between axially distal radial surfaces of the dicing saw blades 50 and 52.

Please amend paragraph number [0053] as follows:

[0053] Notably, axially adjacent dicing saw blades 50 and 52 in FIG. 7 are spaced in relationship to noncongruent sides of each dicing saw blade 50, 52 of the pair. Therefore, dicing saw blade 50 and dicing saw blade 52 are positioned such that dicing saw blade surface 51 is a fixed axial distance from dicing saw blade side 53'. Likewise, dicing saw blade side 53' is a fixed axial distance from dicing saw blade-side-surface 55. The relative position of each dicing saw blade with respect to an adjacent paired dicing saw blade is determined by the axial dimensions of the flange that contains the dicing saw blade, as well as the dimensions of the

adjacent flange. In contrast, the embodiments shown in FIG. 3A and 4 provide fixed distances between congruent sides of each dicing saw blade